FIG. 1

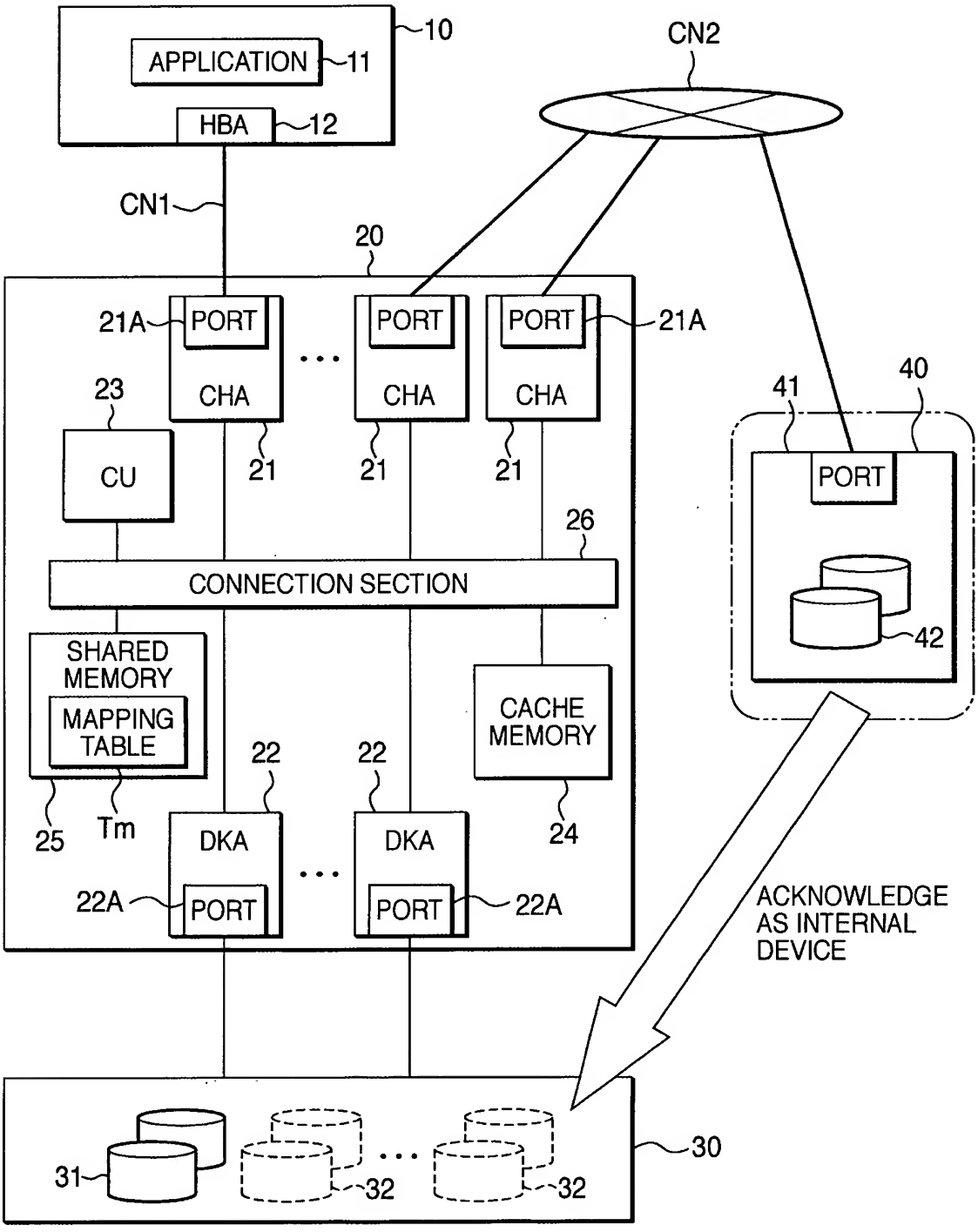

10
APPLICATION
11
HBA
12
CN1
CN2
20
21A
PORT
CHA
21
23
CU
26
CONNECTION SECTION
SHARED MEMORY
MAPPING TABLE
25
Tm
CACHE MEMORY
24
22
DKA
22A
41
40
42
ACKNOWLEDGE AS INTERNAL DEVICE
30
31
32

FIG. 2

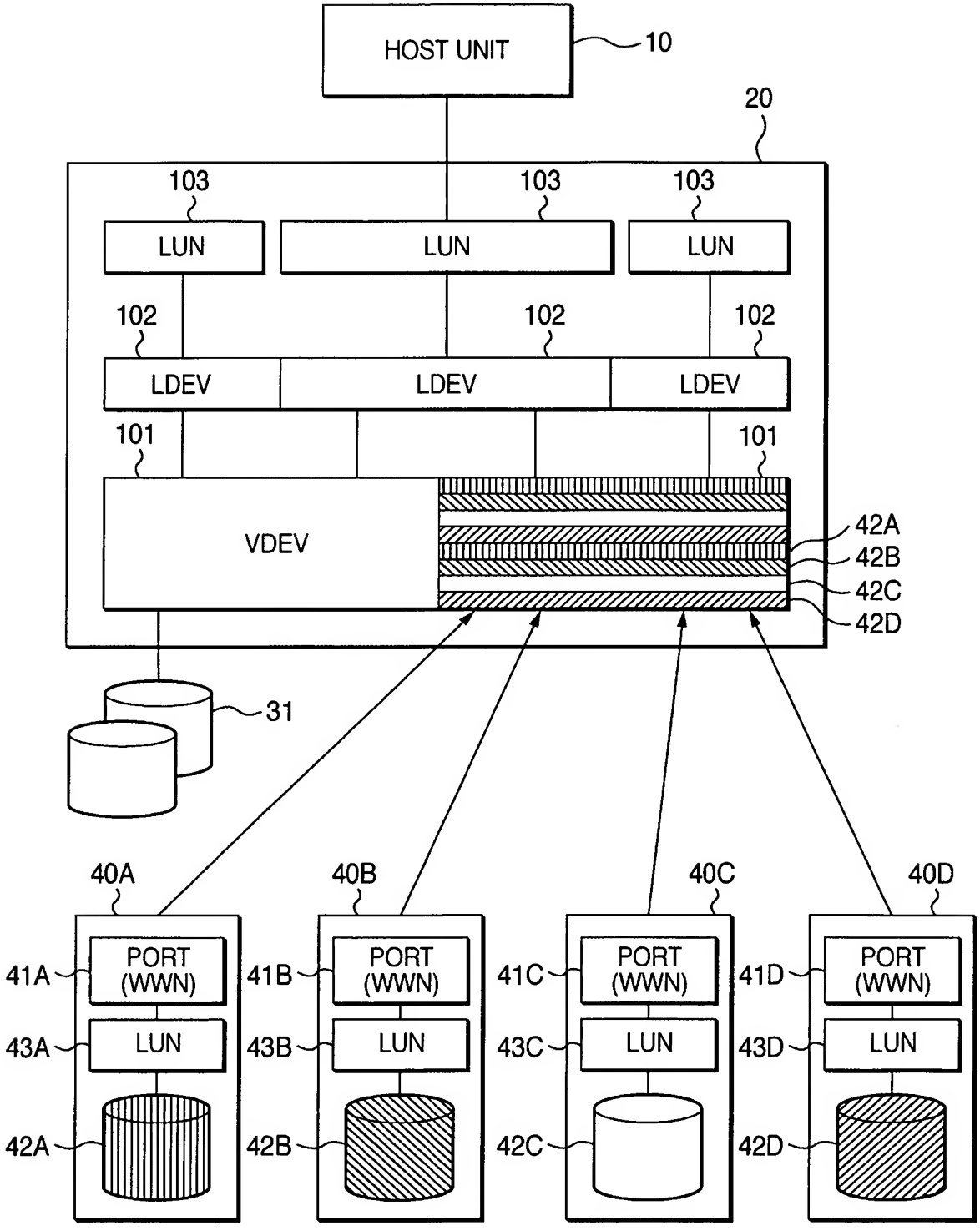

HOST UNIT
10
20
103
103
103
LUN
LUN
LUN
102
102
102
LDEV
LDEV
LDEV
101
101
VDEV
42A
42B
42C
42D
31
40A
40B
40C
40D
41A
41B
41C
41D
PORT (WWN)
PORT (WWN)
PORT (WWN)
PORT (WWN)
43A
43B
43C
43D
LUN
LUN
LUN
LUN
42A
42B
42C
42D

FIG. 3

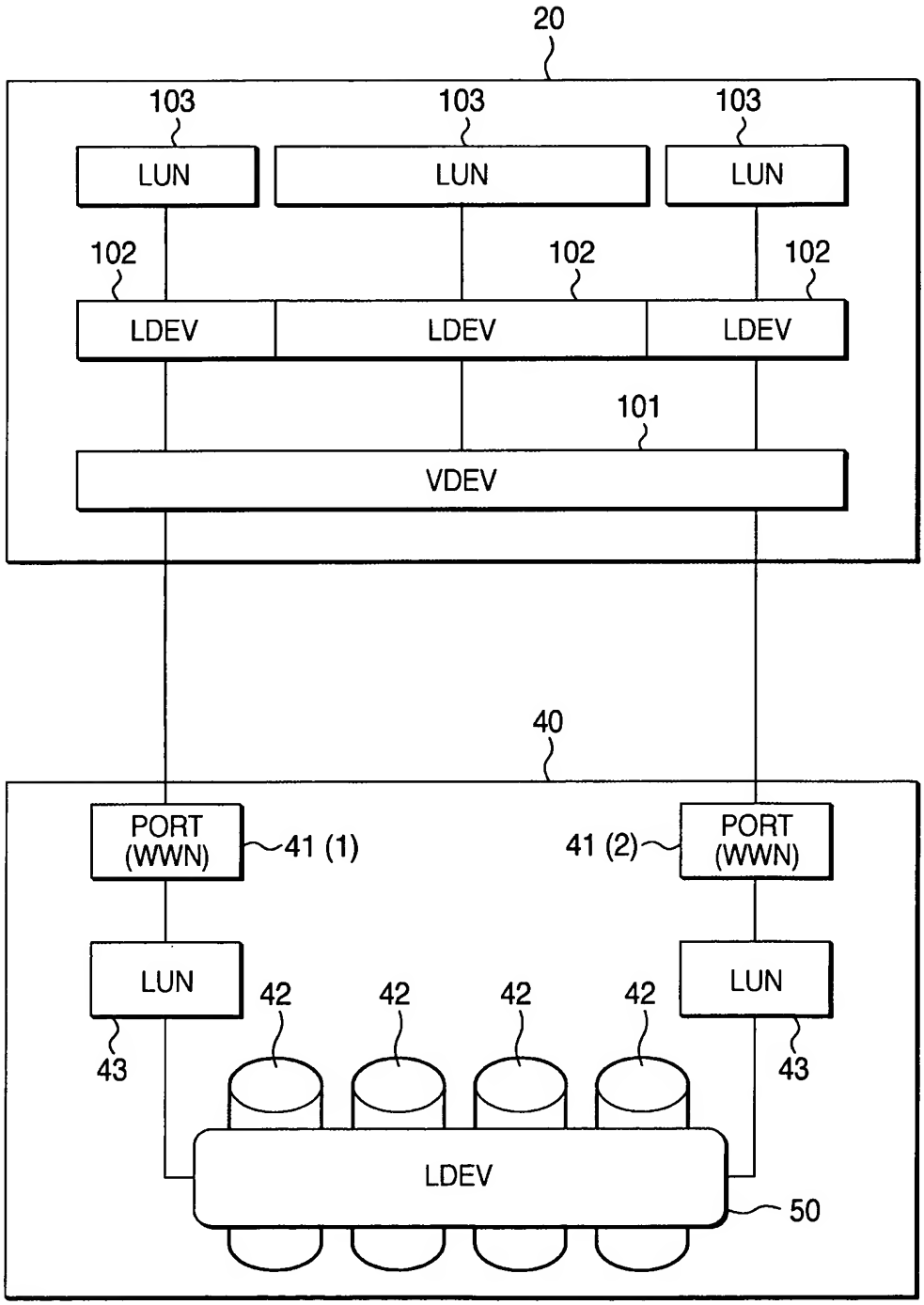

20
103
103
103
LUN
LUN
LUN
102
102
102
LDEV
LDEV
LDEV
101
VDEV
40
PORT (WWN)
41 (1)
41 (2)
PORT (WWN)
LUN
LUN
42
42
42
42
43
43
LDEV
50

FIG. 4

Tm

VDEV	EXTERNAL DEVICE INFORMATION				
	DEVICE IDENTIFYING INFORMATION	CAPACITY (KB)	DEVICE TYPE	PATH INFORMATION	
				WWN	LUN
0	DRFGTFNEIEK	657,456	DISK	0xAABBCCDD	0
1	ADRFGTFNEIE	89,854	DISK	0xAABBEEFF	3
2	GGRRFFDDERT	—	TAPE	0x445566AAB	5
3	AABBCCDDEE	5,544,223	DISK	0x77DE12345	6
				0x77DE12345	3
				0x377DE7890	5

ALTERNATE PATH

FIG. 5

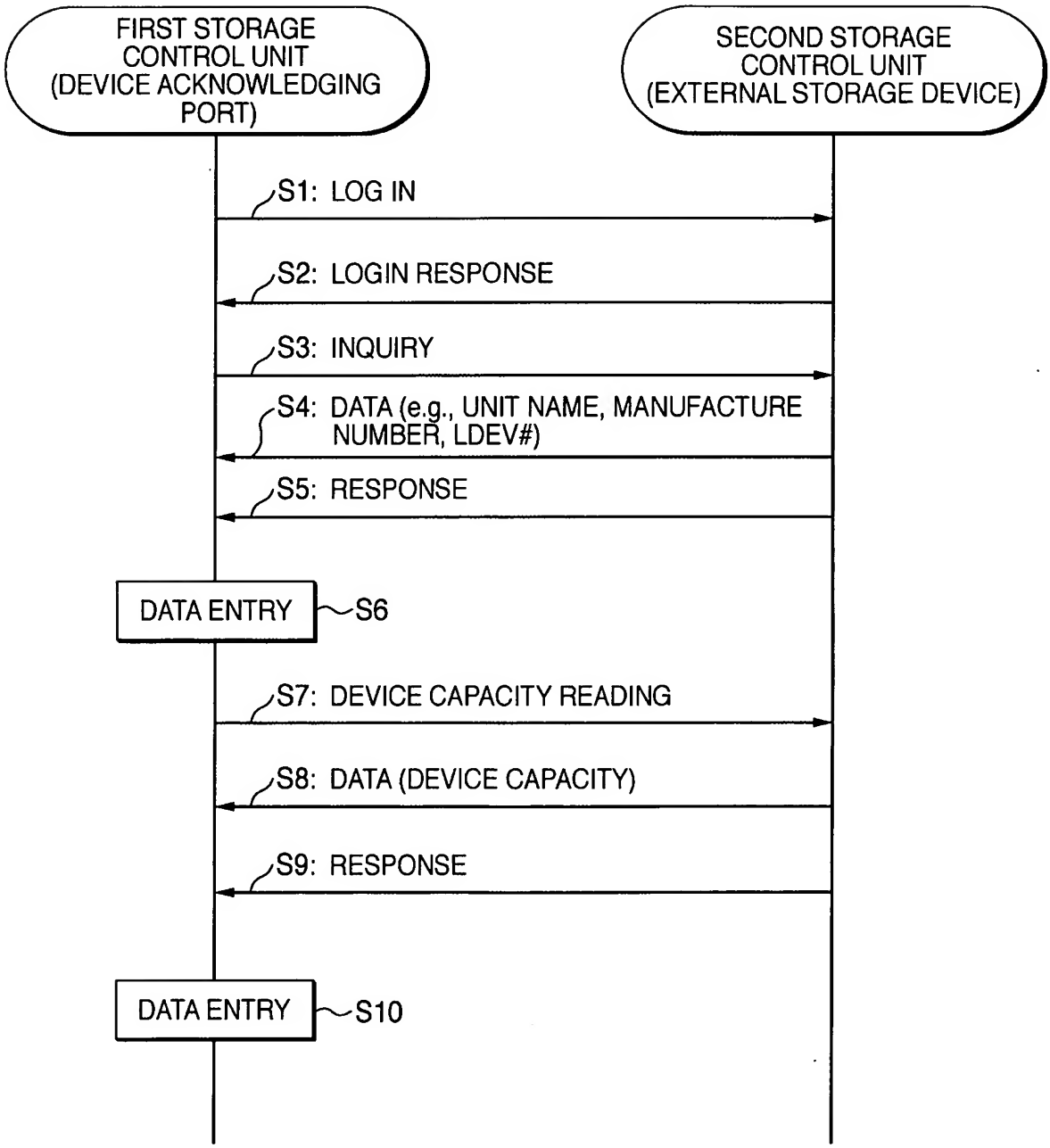

FIRST STORAGE CONTROL UNIT (DEVICE ACKNOWLEDGING PORT)
SECOND STORAGE CONTROL UNIT (EXTERNAL STORAGE DEVICE)
S1: LOG IN
S2: LOGIN RESPONSE
S3: INQUIRY
S4: DATA (e.g., UNIT NAME, MANUFACTURE NUMBER, LDEV#)
S5: RESPONSE
DATA ENTRY
S6
S7: DEVICE CAPACITY READING
S8: DATA (DEVICE CAPACITY)
S9: RESPONSE
DATA ENTRY
S10

FIG. 6A

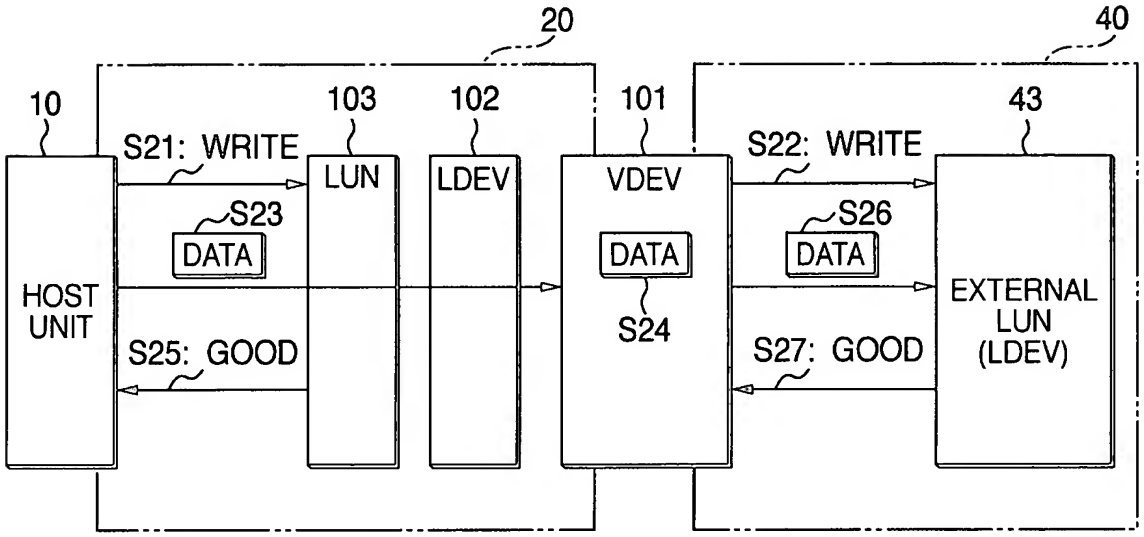

20
40
10
103
102
101
43
S21: WRITE
LUN
LDEV
VDEV
S22: WRITE
S23
DATA
DATA
S26
DATA
HOST UNIT
S24
EXTERNAL LUN (LDEV)
S25: GOOD
S27: GOOD

FIG. 6B

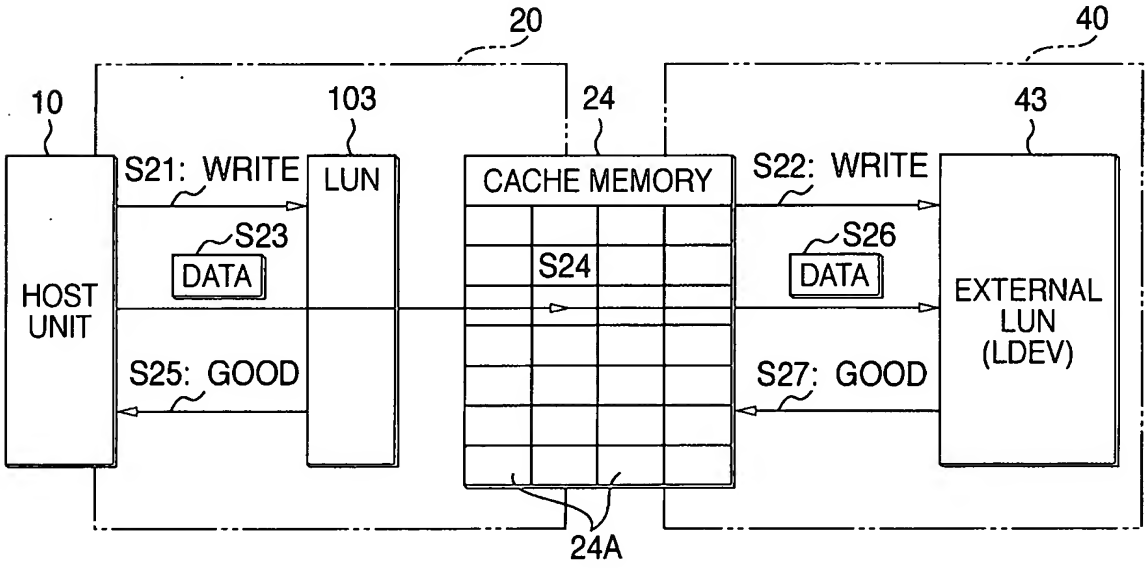
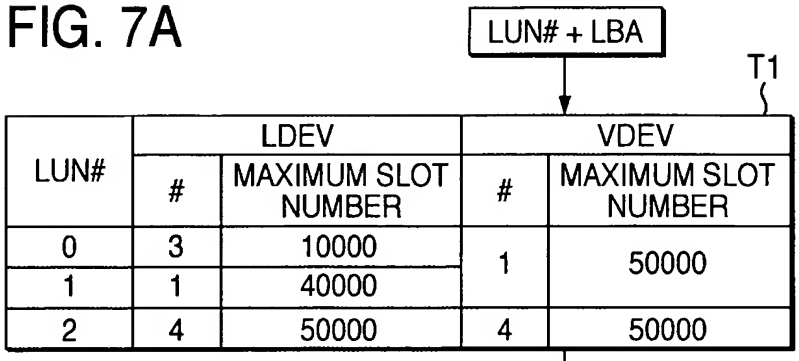

20
40
10
103
24
43
S21: WRITE
LUN
CACHE MEMORY
S22: WRITE
S23
DATA
S24
S26
DATA
HOST UNIT
EXTERNAL LUN (LDEV)
S25: GOOD
S27: GOOD
24A

FIG. 7A



LUN#	LDEV		VDEV	
	#	MAXIMUM SLOT NUMBER	#	MAXIMUM SLOT NUMBER
0	3	10000	1	50000
1	1	40000		
2	4	50000	4	50000

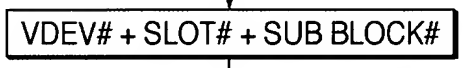
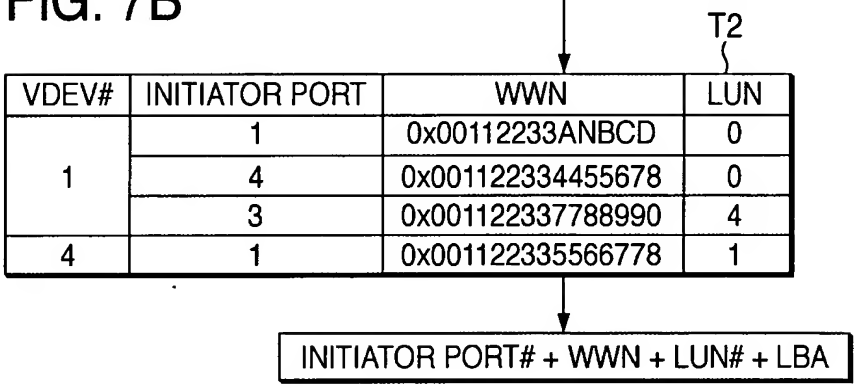


FIG. 7B



VDEV#	INITIATOR PORT	WWN	LUN
1	1	0x00112233ANBCD	0
	4	0x001122334455678	0
	3	0x001122337788990	4
4	1	0x001122335566778	1

FIG. 7C

T2a

VDEV#	STRIPE SIZE	RAID LEVEL	COMPETITORS' SS#	VDEV-EXTERNAL LUN PATH		
				INITIATOR PORT#	WWN	LUN
1	64BYTE	RAID1	1	1	0x00112233ANBCD	0
				4	0x001122334455678	0
				3	0x001122337788990	4
			4	1	0x001122334455678	1
			6	3	0x001122337788990	2
			7	3	0x001122334455678	5

FIG. 8A

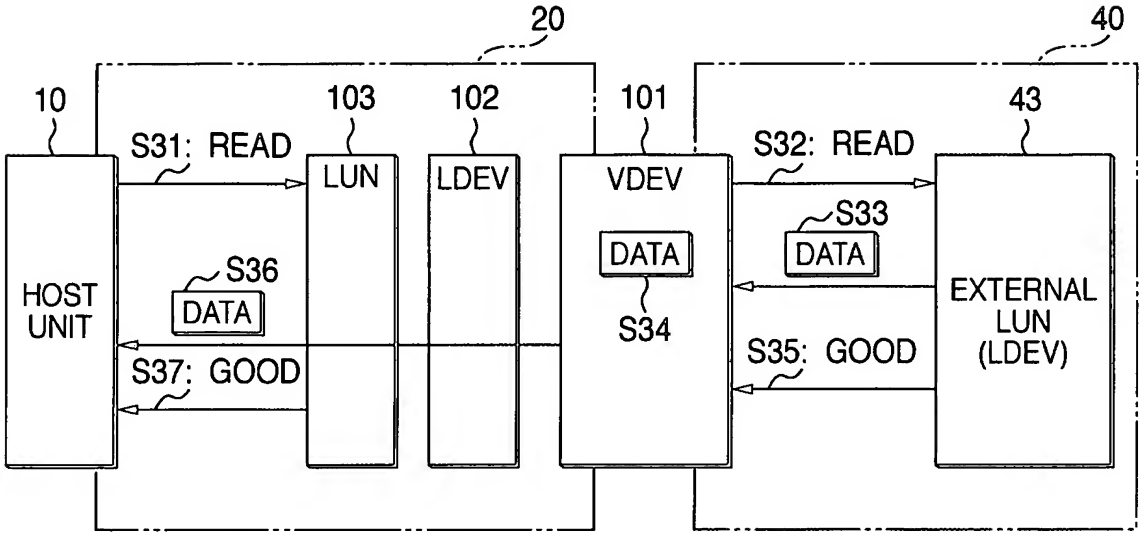
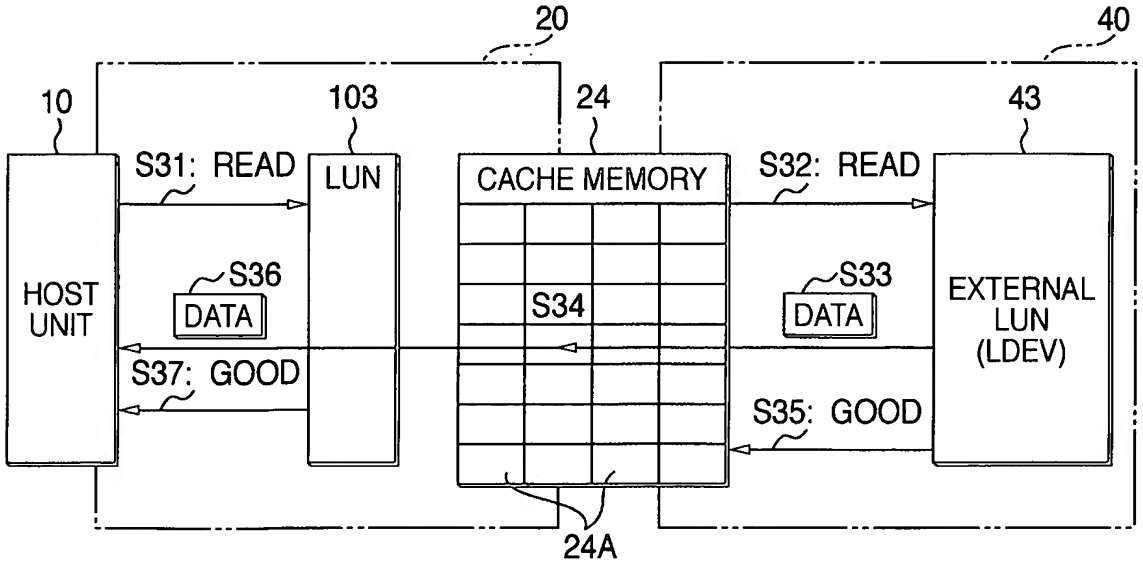

20
40
10
103
102
101
43
S31: READ
LUN
LDEV
VDEV
S32: READ
S33
DATA
DATA
S36
DATA
HOST
UNIT
S34
EXTERNAL
LUN
(LDEV)
S35: GOOD
S37: GOOD

FIG. 8B


20
40
10
103
24
43
S31: READ
LUN
CACHE MEMORY
S32: READ
S36
DATA
S33
DATA
HOST
UNIT
S34
EXTERNAL
LUN
(LDEV)
S37: GOOD
S35: GOOD
24A

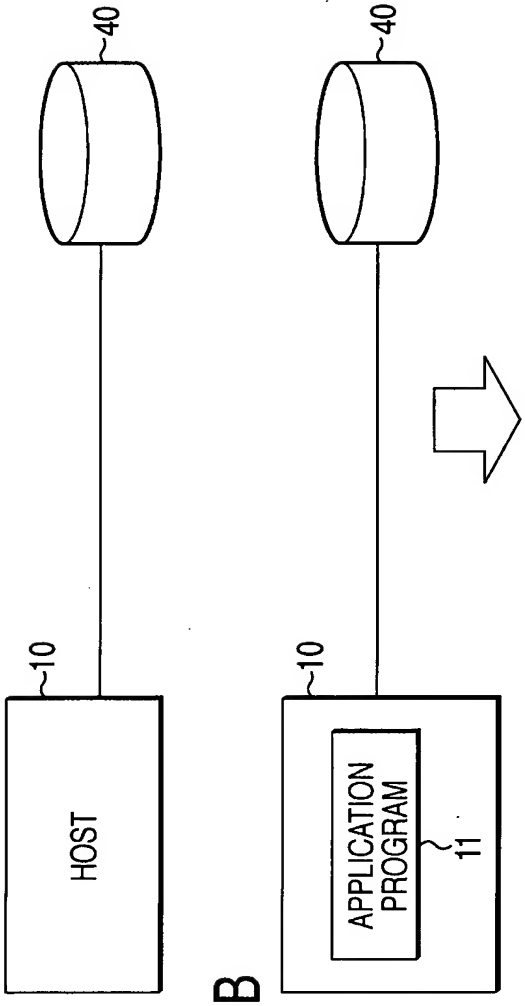


FIG. 9A

FIG. 9B

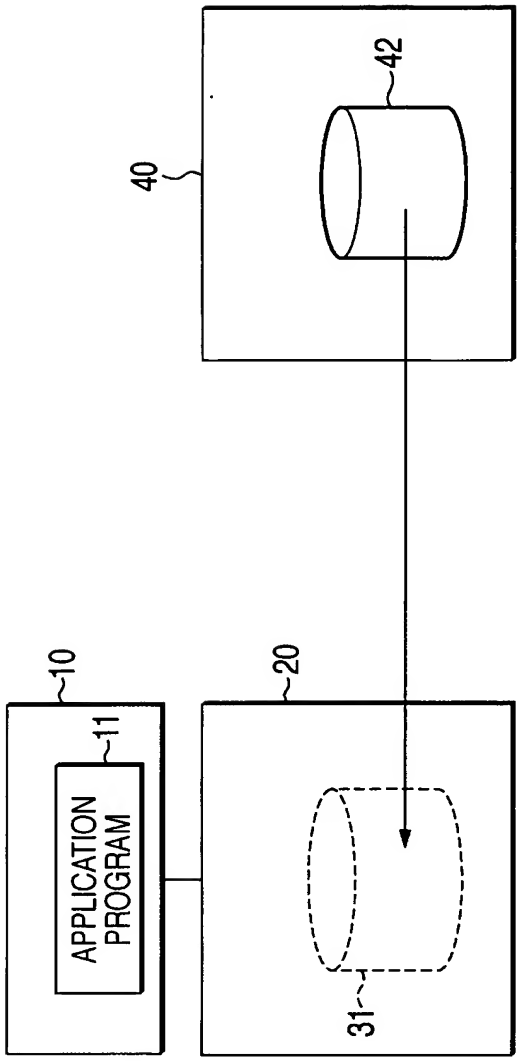


FIG. 9C

FIG. 10

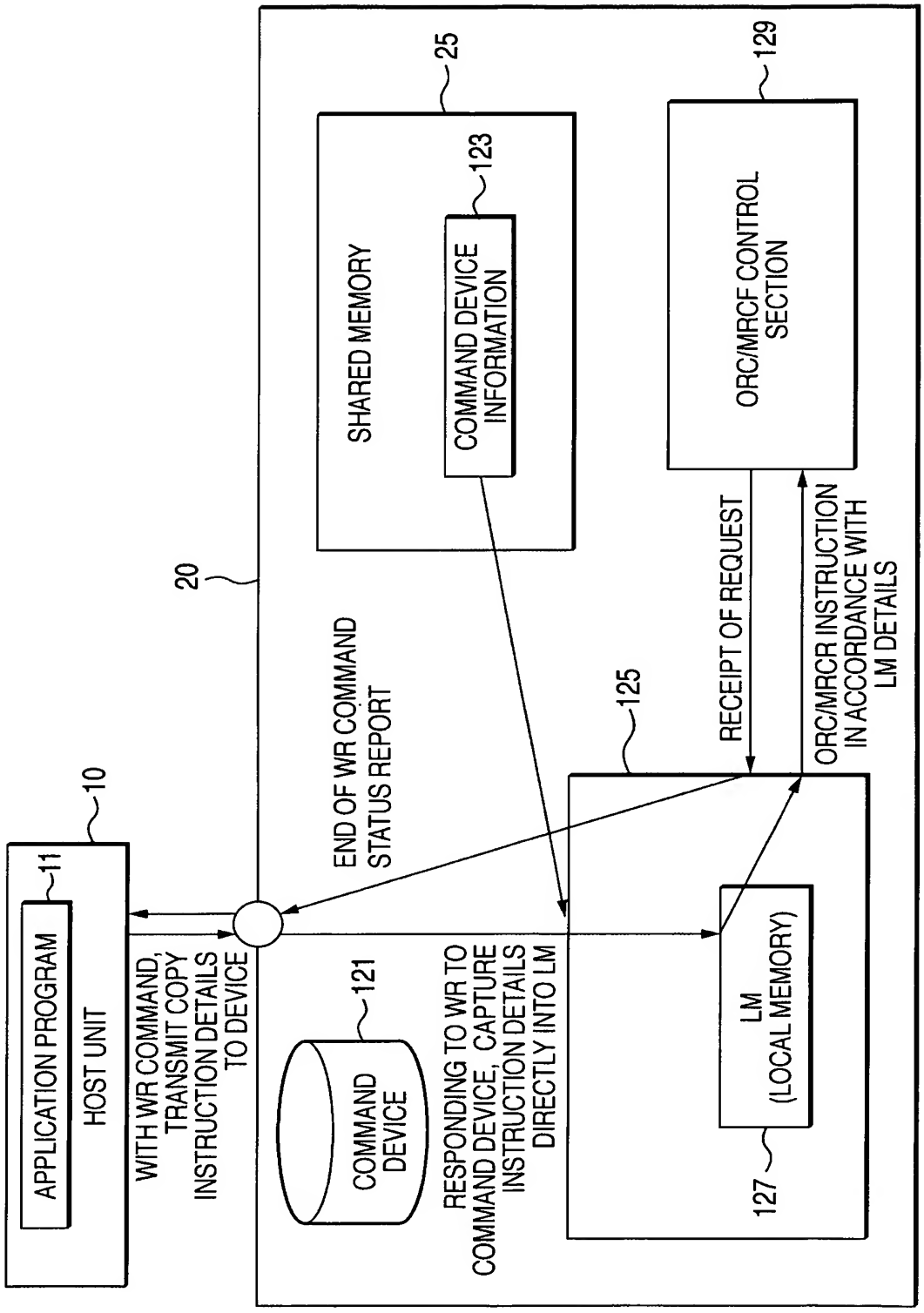

10
APPLICATION PROGRAM
11
HOST UNIT
WITH WR COMMAND, TRANSMIT COPY INSTRUCTION DETAILS TO DEVICE
20
25
SHARED MEMORY
123
COMMAND DEVICE INFORMATION
END OF WR COMMAND STATUS REPORT
121
COMMAND DEVICE
RESPONDING TO WR TO COMMAND DEVICE, CAPTURE INSTRUCTION DETAILS DIRECTLY INTO LM
125
127
LM (LOCAL MEMORY)
RECEIPT OF REQUEST
ORC/MRCR INSTRUCTION IN ACCORDANCE WITH LM DETAILS
129
ORC/MRCF CONTROL SECTION

FIG. 11

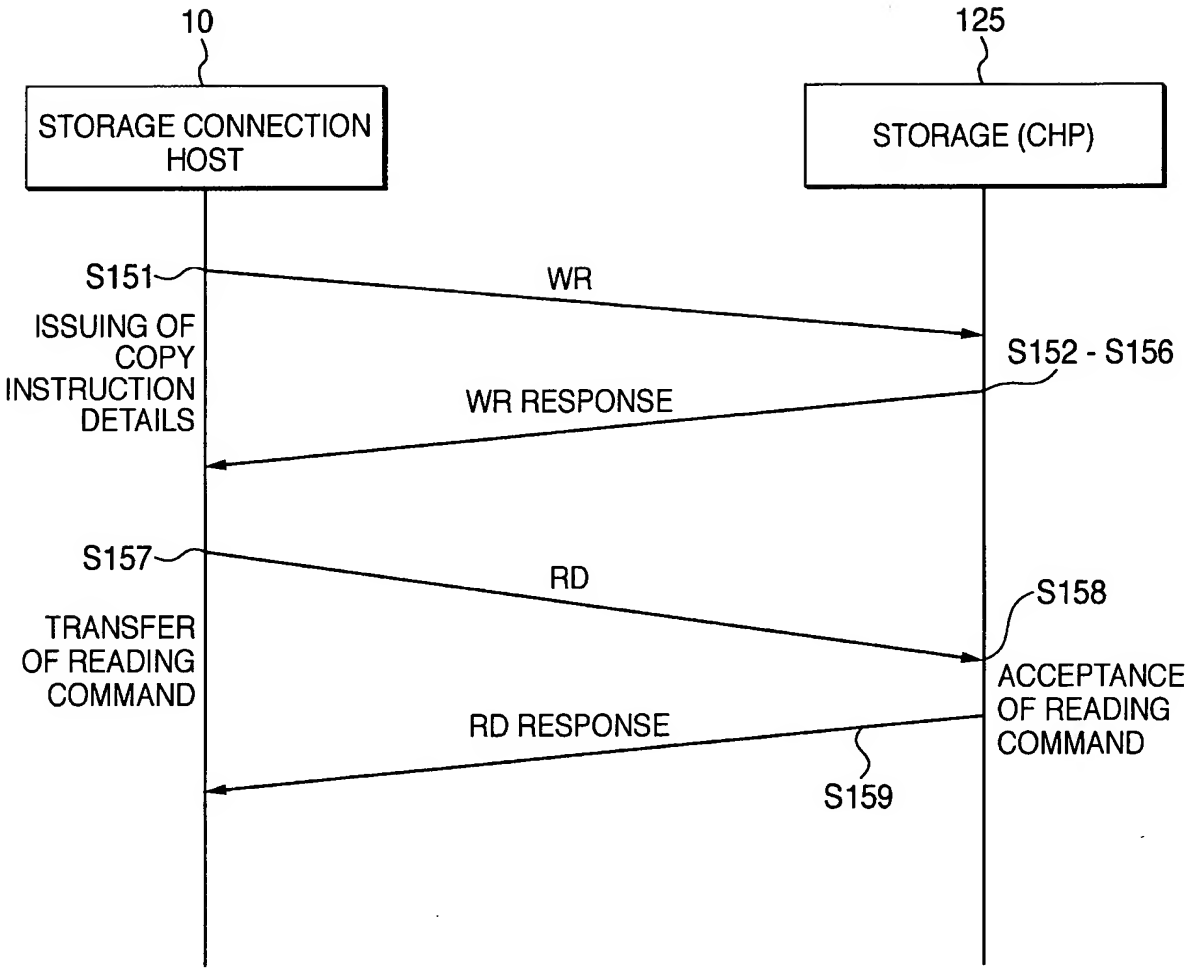

10
125
STORAGE CONNECTION HOST
STORAGE (CHP)
S151
WR
ISSUING OF COPY INSTRUCTION DETAILS
S152 - S156
WR RESPONSE
S157
RD
S158
TRANSFER OF READING COMMAND
ACCEPTANCE OF READING COMMAND
RD RESPONSE
S159

FIG. 12A

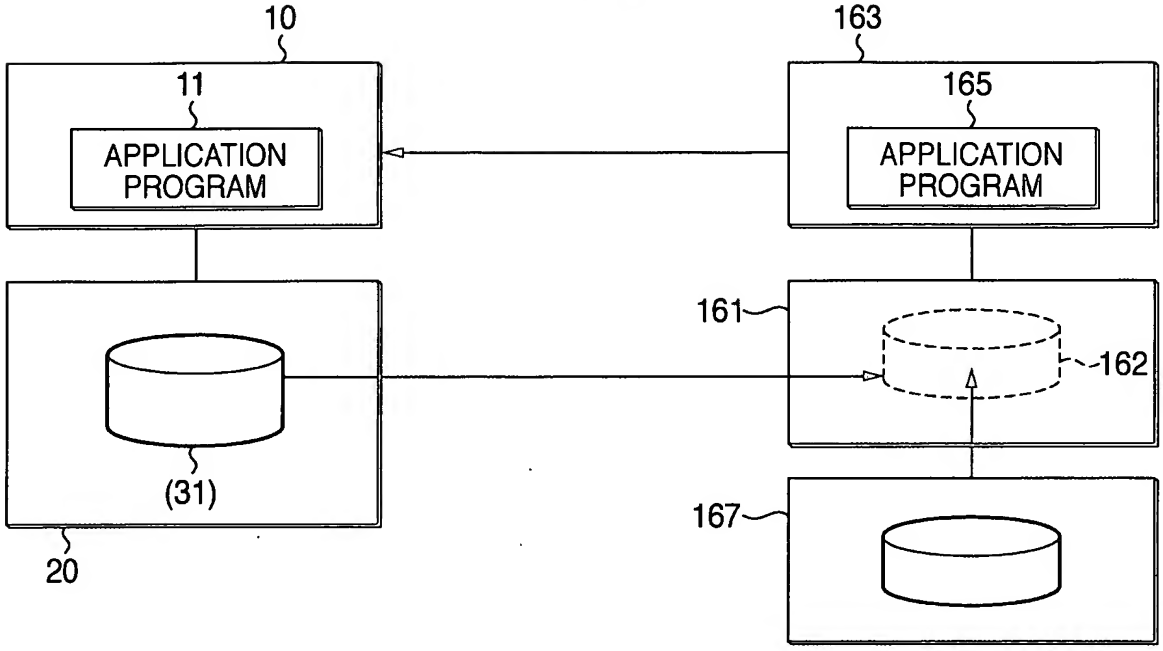


FIG. 12B

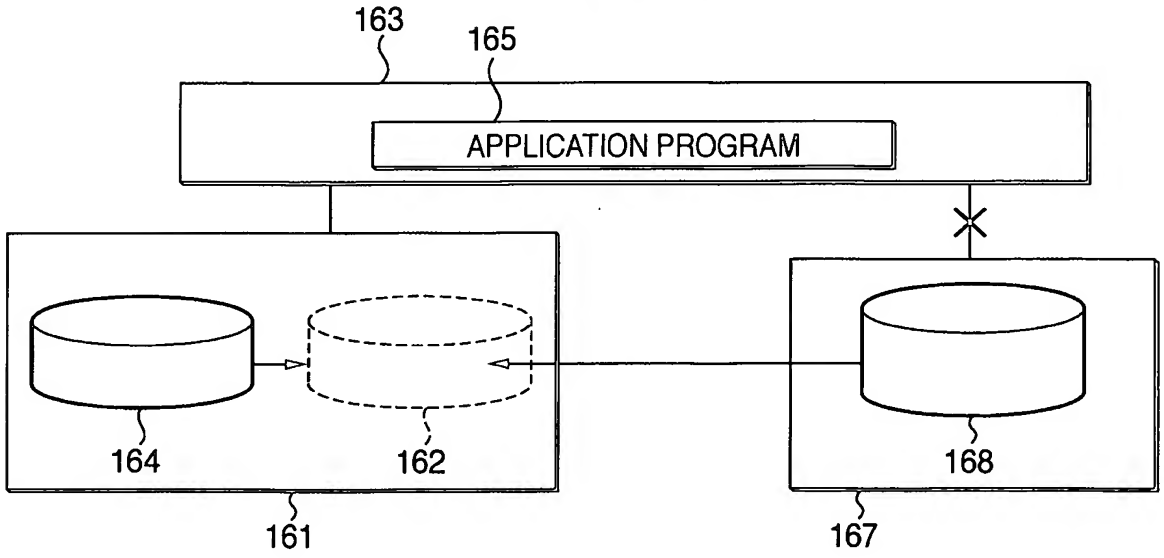


FIG. 13A

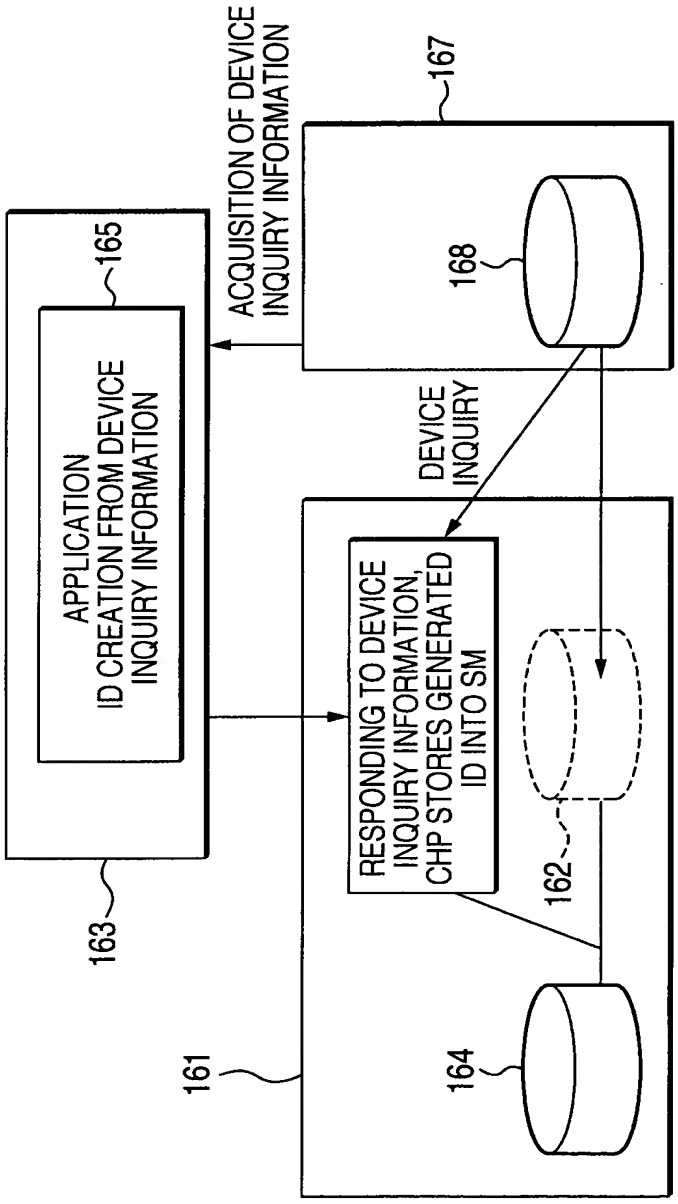

ACQUISITION OF DEVICE INQUIRY INFORMATION
167
168
165
APPLICATION ID CREATION FROM DEVICE INQUIRY INFORMATION
DEVICE INQUIRY
RESPONDING TO DEVICE INQUIRY INFORMATION, CHP STORES GENERATED ID INTO SM
162
163
161
164

FIG. 13B

VDEV	EXTERNAL DEVICE INFORMATION				
	DEVICE IDENTIFYING INFORMATION (ID)	CAPACITY (K BYTE)	DEVICE TYPE	PATH INFORMATION	
				WWN	LUX
0	DRFGTFNEIEK WNF1GKEF	657,456	DISK	0xAABBCCDD EEFF0000	0
1	ADRFGTFNEIE KWN33445	89,354	DISK	0xAABBCCD DEEFF0000	3
2	GGRRFFDDER TT00	—	TAPE	0x44556677 AA331122	5
3	AABBCCDD EEFF	5,544,223	DISK	0x77DE12435 5889922	6
				0x77DE12435 588910	3
				0x77DE12435 588988	5

FIG. 13C

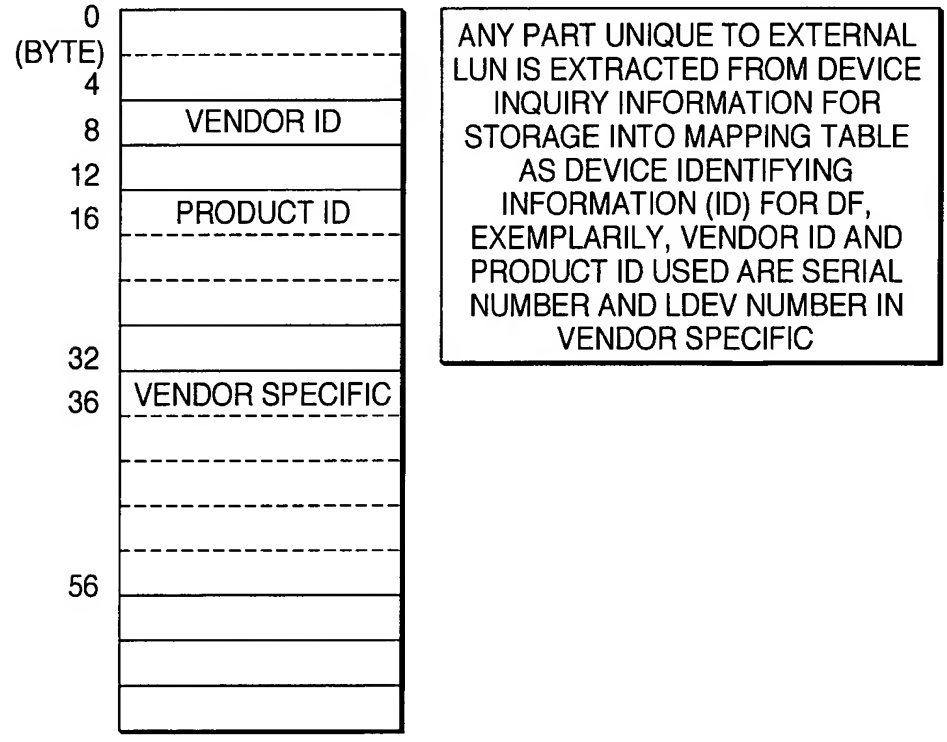


FIG. 14

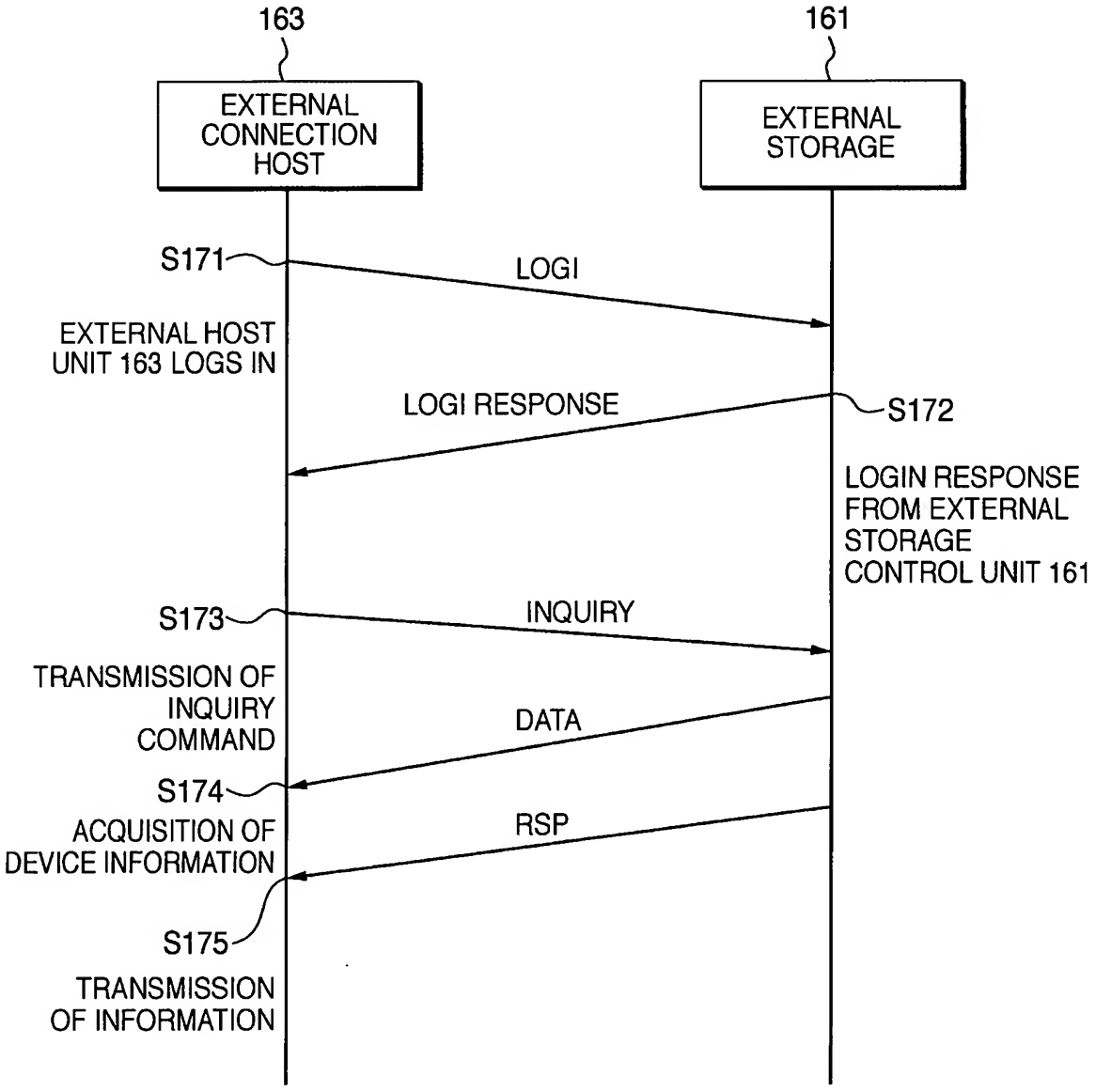

163
161
EXTERNAL CONNECTION HOST
EXTERNAL STORAGE
S171
LOGI
EXTERNAL HOST UNIT 163 LOGS IN
LOGI RESPONSE
S172
LOGIN RESPONSE FROM EXTERNAL STORAGE CONTROL UNIT 161
S173
INQUIRY
TRANSMISSION OF INQUIRY COMMAND
DATA
S174
ACQUISITION OF DEVICE INFORMATION
RSP
S175
TRANSMISSION OF INFORMATION

FIG. 15

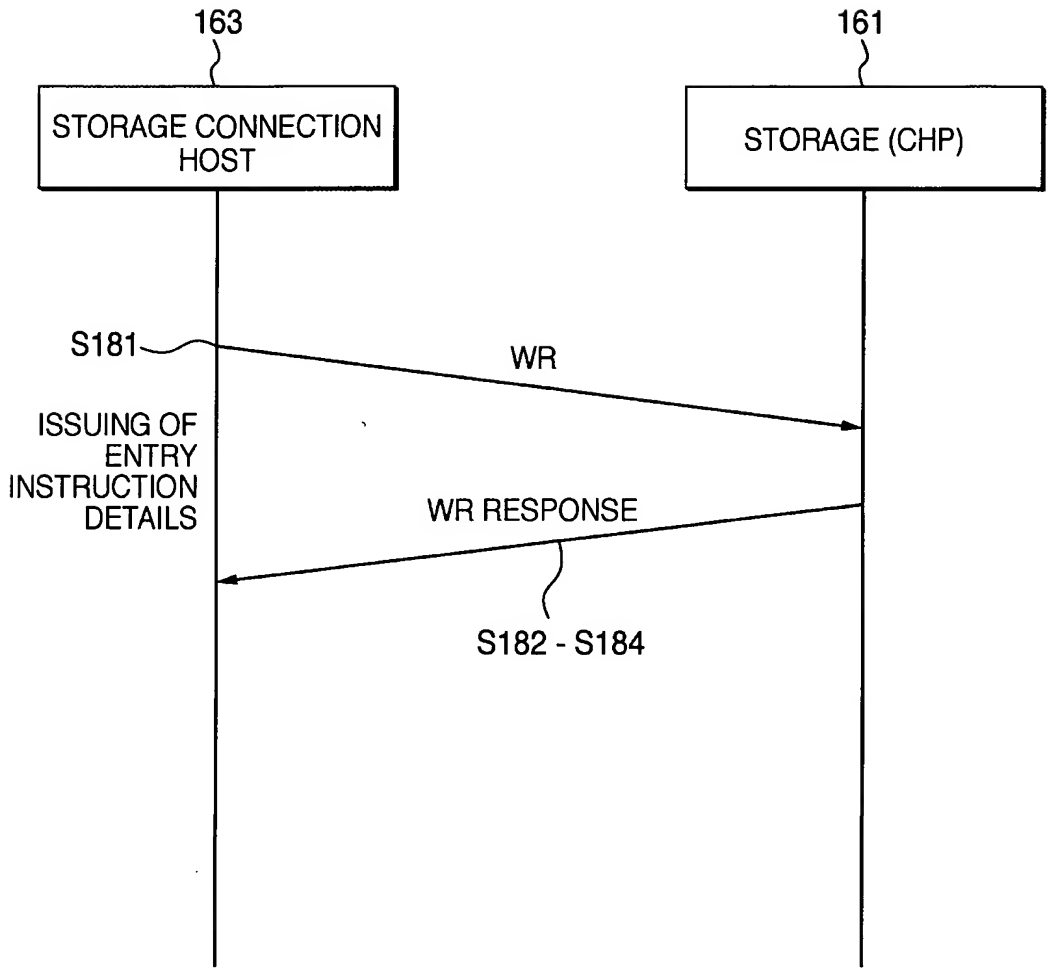

163
161
STORAGE CONNECTION HOST
STORAGE (CHP)
S181
WR
ISSUING OF ENTRY INSTRUCTION DETAILS
WR RESPONSE
S182 - S184

FIG. 16

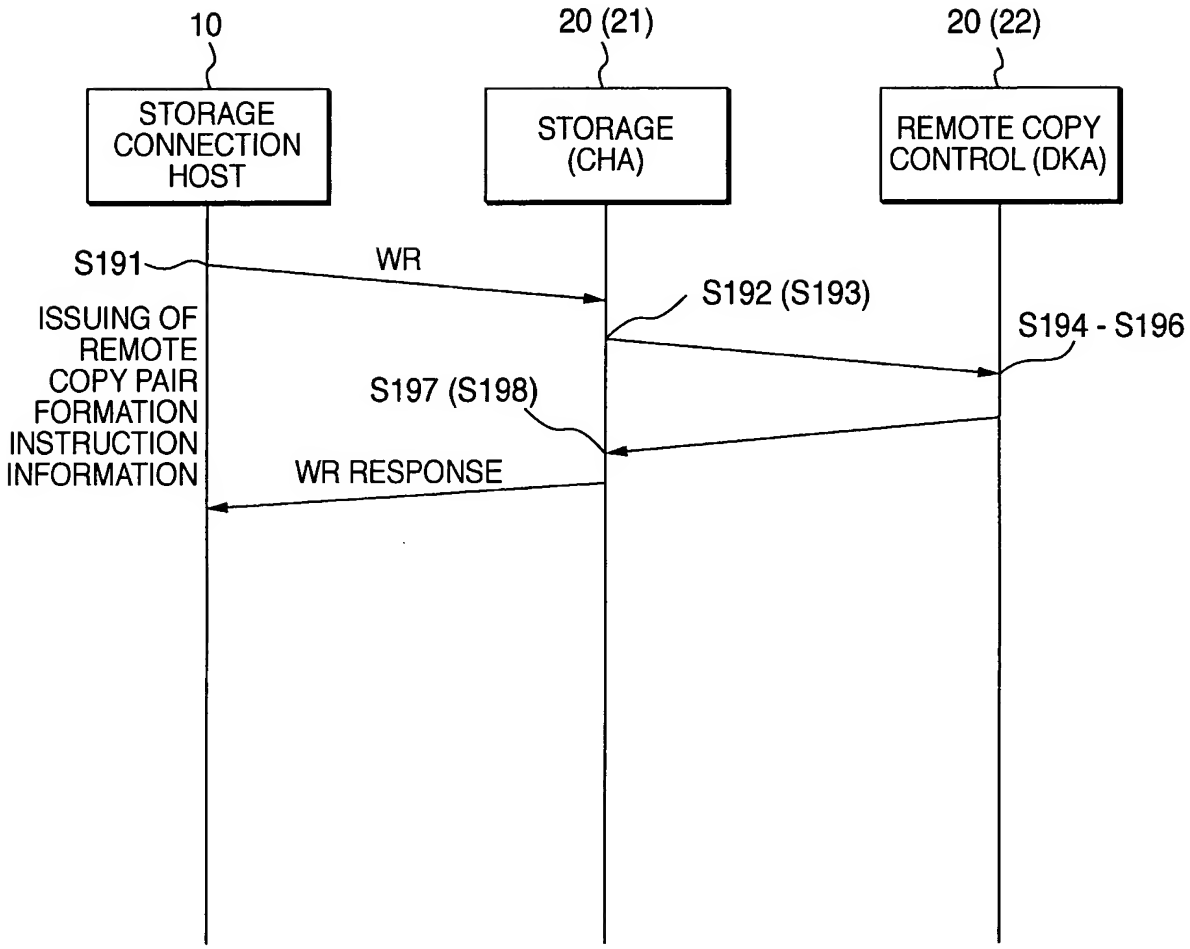

10
20 (21)
20 (22)
STORAGE CONNECTION HOST
STORAGE (CHA)
REMOTE COPY CONTROL (DKA)
S191
WR
S192 (S193)
S194 - S196
ISSUING OF REMOTE COPY PAIR FORMATION INSTRUCTION INFORMATION
S197 (S198)
WR RESPONSE

FIG. 17A

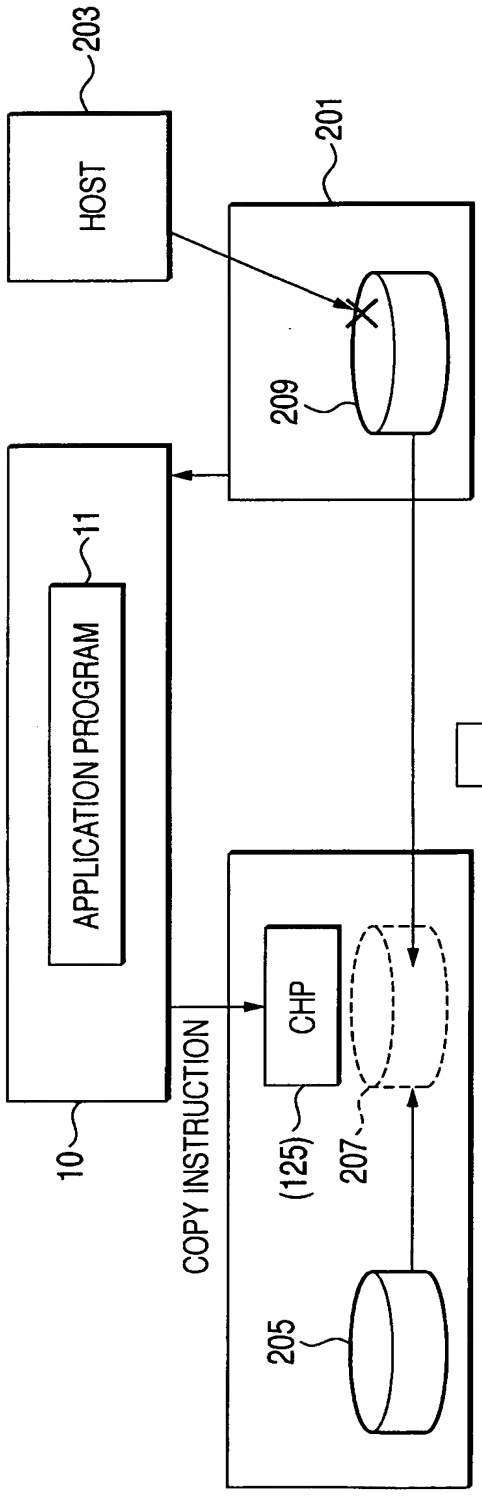


FIG. 17B

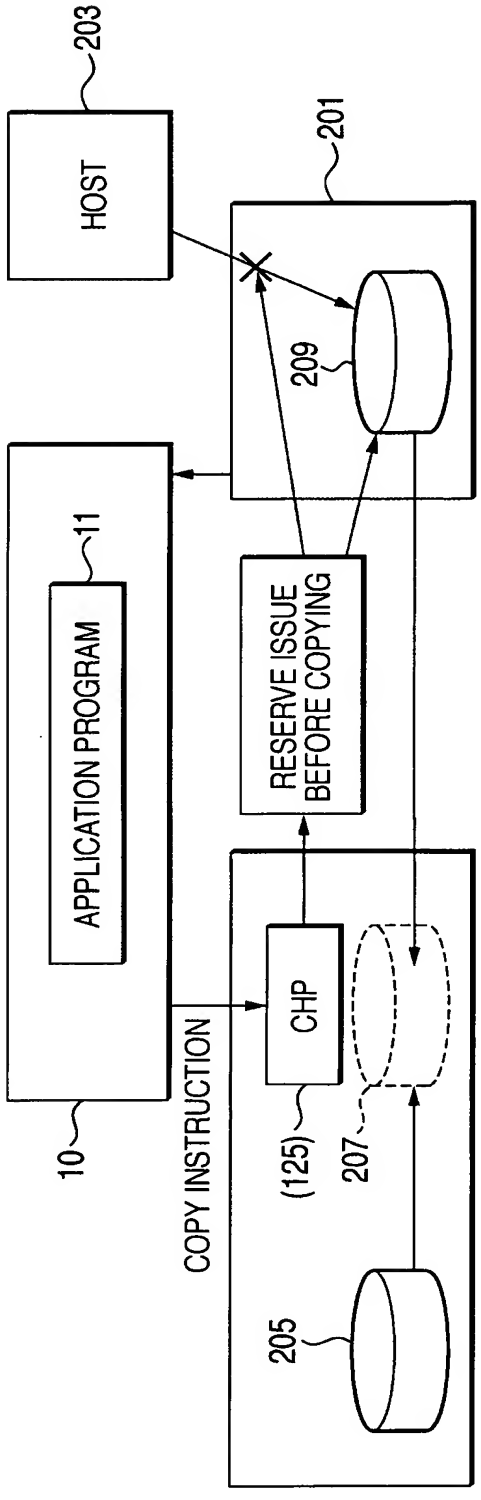


FIG. 18A

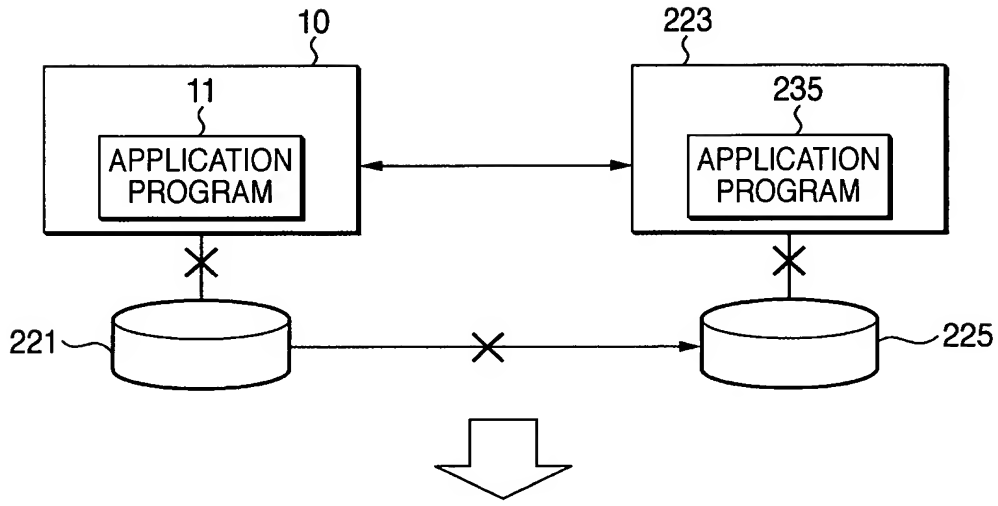
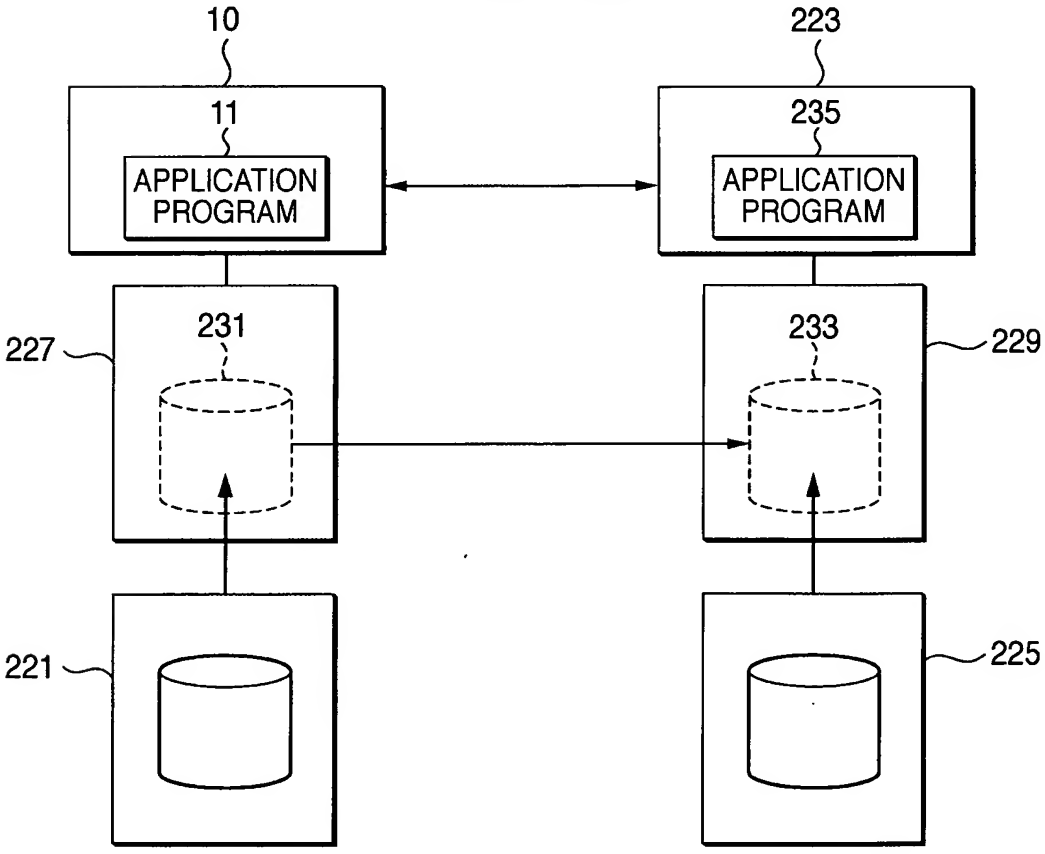



FIG. 18B